# Procedures for Permitting Poultry Incinerators
# (For units charging 200 lbs/hour or less)

## PURPOSE

The following are air permitting procedures for non-commercial incinerators used in the disposal of poultry carcasses with maximum capacity of 200 lbs per hour or less.

## REFERENCES AND RESOURCES

1. Virginia Department of Environmental Quality, "Incinerator Procedures", February 24, 1998

2. The following sections of Title 9 of the Virginia Administrative Code (VAC):

   9 VAC 5 Chapter 40, Part II, Article 7 – Emission Standards for Incinerators
   9 VAC 5 Chapter 50, Part II, Article 4 – Standards of Performance for Stationary Sources
   9 VAC 5-80-10 - Permits – New and Modified Stationary Sources
   9 VAC 5-80-11 - Stationary Source Permit Exemption Levels

3. Title 30 of the Texas Administrative Code (TAC) §106.494 – Permits by Rule, Pathological Waste Incinerators

4. Texas Natural Resource Conservation Commission, Standard Exemption Protectiveness, Technical Review, Pathological Waste Incinerators, 1999

5. Florida Administrative Code (FAC) Rule 62-210.300(1) – Animal Crematory Air General Permit

6. Arkansas Department of Environmental Quality (ADEQ) – Draft Minor Source General Air Permit for Animal/Human Remains Incinerators and Statement of Basis

7. United States Environmental Protection Agency, "Compilation of Air Pollutant Emission Factors (AP-42)", Fifth Edition

8. Air & Waste Management Association, "Air Pollution Engineering Manual", Van Nostrand Reinhold, 1992

9. United States Department of Agriculture, "U.S. Farm Economics Summary", 1999/2000

## DEFINITIONS

1. Carcasses – Dead animals, in whole or in part

2. Non-commercial incinerator – An incinerator which does not accept pathological waste or carcasses generated off-site for monetary compensation

## PERMIT APPLICABILITY AND APPLICATION REQUIREMENTS

In accordance with 9 VAC 5-80-11, all incinerators constructed after March 17, 1972 regardless of size, or type of waste combusted, are required to obtain minor new source review permits prior to construction/installation. Only a small number of poultry incinerators have actually been permitted in the state.[1] Subsequent to the development of this procedure, air permitting of these units was addressed through the agency's Incinerator Procedures.

Applicants may apply for permits using the Form 7. A complete submittal should include a Local Governing Body Form (LGOF), Pages 1-3 and the attached supplemental information form for poultry incinerators. The supplement is intended to substitute for the standard Form 7 pages for incinerators (Page 7, 11, 12, 14 – 16).

## ESTIMATING EMISSIONS

Uncontrolled Emissions - Emission from these units may be estimated using emission factors contained in AP-42, Table 2.1-12, "Uncontrolled Emission Factors for Refuse Combustors Other Than Municipal Waste", Industrial/Commercial Combustors. Although the class of incinerators covered by these procedures is a dual-chambered unit, emission data for single-chambered units is provided for comparison purposes. As defined by AP-42, these factors cover a wide-range of units from 50-400 lbs/hour which are manually charged and intermittently operated.

Estimated emissions from these units are extremely low. All may be classified as minor (B) sources. Uncontrolled emissions for the largest unit covered by these procedures (200 lbs/hr) are as follows:

***Table 1 : Uncontrolled Emissions Estimates for Incinerators***

| Pollutant[1,4] | PM[3] | CO | SO | $NO_x$ | VOC |
|---|---|---|---|---|---|
| Single-chamber Unit[2] | | | | | |
| Hourly Emissions (lbs/hr) | 1.5 | 2.0 | 0.25 | 0.2 | 1.5 |
| Annual Emissions (tpy) | 6.6 | 8.76 | 1.1 | 0.88 | 6.6 |
| Dual-chamber Unit[2] | | | | | |
| Hourly Emissions (lbs/hr) | 0.7 | 1.0 | 0.25 | 0.3 | 0.3 |
| Annual Emissions (tpy) | 3.1 | 4.4 | 1.1 | 1.3 | 1.3 |

[1] While composting appears to be the most widely used approach to dispose of dead birds, a number of poultry farms in Virginia, particularly breeding operations, use or plan to use incineration to dispose of daily mortality. Off-site rendering has been discontinued due to biosecurity concerns raised by the recent avian influenza epidemic.

Notes:

1. *AP-42 provides no data concerning the potential for air toxics from these units. Actual emissions of toxics are expected to be insignificant if the unit is operated in accordance with the permit conditions specified below.*
2. *Based on the operating rate of 200 lbs/hr (maximum capacity covered by this procedure) for 8760 hours per year.*
3. *Grain loading for PM and concentration for CO may be substituted if known for the unit being permitted.*
4. *Emission estimates do not include fuel combustion. Refer to fuel section below.*

Expected Actual Emissions – Expected actual emissions may be estimated using the emission factors above and the quantity of waste to be burned. These data should be supplied by the permittee. The following table provides an example on how annual waste throughput may be calculated.

***Table 2: Example data for estimating Annual Waste Rate at Poultry Operations***

| Type | Mortality | Birds per House | Houses per Farm | Flocks per year | Ave. Wt. of Bird[1] (lbs) | Annual Waste Rate (tons/yr) |
|---|---|---|---|---|---|---|
| **Commercial Meat Farms** | | | | | | |
| Broilers[2] (Chickens) | 2.5% | 38,500 | 2 | 7 | 2 | 13.5 |
| Turkey Hens[2] | 7.0% | 11,400 | 2 | 5 | 8 | 32.0 |
| **Breeder Operations** | | | | | | |
| Chicken Hens[3] | 7% | 7600 | 2 | 1.1 | 7 | 4.2 |
| Pullets[3] | 7% | 17,100 | 1 | 2 | 3.5 | 4.2 |

Notes:

1. *Mortality occurs early in flock life. Average weight of each bird incinerated is approximately 50% of the estimated market weight.*
2. *Rocco Farm Foods data*
3. *Perdue data*

## PROCESS REQUIREMENTS

The incinerator class covered by this permit are dual-chambered units with a primary combustion chamber fired by natural gas, propane, or distillate oil, followed by a secondary combustion chamber also fired by additional fuel. These are batch-loaded units that undergo a set burn-down cycle in accordance with manufacturer's recommendations. The rated capacity of the units is 200 lbs./hour or less. Conditions for permit approval should include the following:

Approved Waste – Waste to be burned should be limited to poultry carcasses generated on-site.

Burn Down Cycle – The burn-down cycle shall be automatically controlled and the cycle time shall be in accordance with the manufacturers' recommendations.

Incinerator Operation – Process requirements should also include a requirement to operate the unit in accordance with the manufacturer's operating instructions (these should be posted at or near the unit

## OPERATING AND EMISSION LIMITATIONS

In addition to general process requirements indicated above, the following design, operating and emission limitations shall be included:

Emission Controls – Dual or multi-chamber units provide the best design to ensure complete combustion of waste materials and are recommended as BACT for this boilerplate procedure. A review of incinerator manufacturers operating in the U.S. indicates that there are a number of smaller units that are commercially available that meet these design requirements. A partial listing of these manufacturers are included as an attachment to this procedure. This listing is provided for informational purposes only and should not be viewed as an approval or endorsement of any particular unit.

Secondary Chamber Temperature and Retention Time - In addition to basic design, the secondary chamber temperature and gas residence time are the two key critical parameters necessary to insure complete combustion. For the purposes of this procedure, a minimum temperature of 1400°F with a gas retention time of 0.25 second are to be considered the "BACT floor". While higher temperatures and longer gas retention times are preferred, the lesser requirements should be adequate for most poultry operations located in rural settings. Permit staff may justify more stringent requirements based on individual site suitability (e.g., location to schools, hospitals and nursing homes); this should be considered on a case-by-case basis.

Secondary Chamber Temperature Monitoring – In order to ensure the minimum secondary chamber temperature is maintained, it is recommended that conditions for approval include a device to continuously monitor the secondary chamber temperature.

Automatic Thermostat Controls - Conditions for permit approval under these procedures includes requirements for an automatic thermostat to maintain the minimum secondary chamber. The thermostat may be avoided if it can be demonstrated that the afterburner has sufficient heat input to maintain the minimum secondary chamber temperature. However, this option is less desirable since it results in higher fuel usage.

Interlock System - The incinerator shall also be equipped with an interlock system to prevent primary burner ignition prior to attaining the secondary chamber temperature. This may be substituted with an interlock system that is set to delay primary burner firing for a period of time sufficient to preheat the secondary chamber to the minimum operating temperature.

Throughput Limits – Permits should include throughput limits on a per charge or lb per hour and tons per year basis.

Emission Limitations – Recommended emission limitations include a particulate matter (PM)/PM-10 limit of 0.10 grains/dscf and a carbon monoxide (CO) limit of 100 ppmvd, each corrected to 7% $O_2$ or 12% $CO_2$.

Visible Emissions Limitation – Opacity requirements are recommended at 5% under all circumstances except for start-up, malfunction or shutdown.

## FUEL REQUIREMENTS

It is anticipated that the auxiliary fuel utilized by most of the farm units will be propane. Combustion of other fuels such as natural gas and distillate oil may be requested. At a minimum, permit approval should include a condition indicating the approved fuels. Where distillate oil is utilized, a fuel sulfur content no greater that 0.5% should be required and the permit should contain requirements for fuel certification. However, based on the low emissions anticipated, fuel throughput limits do not appear to be necessary. Refer to the enclosed example to calculate emissions from auxiliary fuel combustion.

## COMPLIANCE DETERMINATION

Permit compliance shall be demonstrated using a combination of recordkeeping and performance testing as follows:

Recordkeeping - The permit boilerplate language includes requirements for the permittee to maintain a monthly incinerator log recording the date, time and estimated weight of each charge burned in the incinerator. At least once per month, the permittee shall additionally monitor the secondary chamber temperature at the mid-point of the burn-down cycle. The permit boilerplate includes a copy of the incinerator log (with instructions) that may be used by the permittee for logging this information. Two copies of this form should be transmitted to the permittee with the final permit.

The recordkeeping condition also includes the requirement for the permittee to estimate fuel usage. This was added to allow the permittee to satisfy exemption criteria in 40 CFR 60, Subpart CCCC, "Standards of Performance for Commercial and Industrial Solid Waste Incineration Units". The exemption criteria found in 40 CFR 60.2020 specifically exempts pathological and agricultural waste incinerators provided records on the amount of waste burned and the weight of fuels combusted are maintained.

Optional recordkeeping requirements are included in the boilerplate for fuel certifications. This requirement should only be necessary if distillate oil is used as the auxiliary fuel. The permit engineer may require additional records on a case-by-case basis.

Stack Testing - Compliance with the PM and CO emission limitations in the permit may be demonstrated either through stack testing or surrogate test data for an identical unit (same make, model, fuel, and capacity) and charged with the same fuel. If surrogate data are used, the test

should be no more than 5-years old and should be submitted prior to permit issue in order to verify compliance with permit conditions.

Visible Emission Evaluation – The permit requires an initial visible emission evaluation [VEE] in accordance with 40 CFR 60, Appendix A, Method 9 for each incinerator; the details of this test shall be arranged with the regional office. The boilerplate also includes optional language for follow-up VEE's at the discretion of DEQ.

## COMPLIANCE SCHEDULES FOR UNPERMITTED UNITS

Based on the anticipated number of unpermitted units that will require new source review permits, but may not meet the process requirements or design, operating and emission requirements outlined above, the permit boilerplate is structured to provide a three-year compliance schedule with interim operating and emission limitations for PM and opacity. These interim requirements along with all bracketed language addressing interim vs. final operating scenarios should be deleted in permits for units that are able to comply up front with the final requirements, or for proposed units which undergo the conventional preconstruction review process.

## FUTURE CONSIDERATIONS

Incinerators permitted under this procedure will be subject to federal rulemaking under Section 129 of the Clean Air Act. The new rules, Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources for Other Solid Waste Incineration (OSWI) Units were originally scheduled for promulgation on November 15, 2000; the schedule for rule adoption was recently revised to November 15, 2005.

Attachments:

1. Incinerator Manufacturer's List
2. Supplemental Information for Form 7, Poultry Incinerators
3. Spreadsheet – Emissions from Fuel Burning

# Incinerators Manufacture's List
## Poultry Operations

The following list is **NOT** an endorsement for or against any incinerator manufacturer or its products. This list is **NOT** comprehensive. Inclusion on this list is **NOT** a pre-approval.

***Crawford Equipment and Engineering***, Brian Gamage, Division Manager, PO Box 593243, Orlando, FL 32859, (407) 851-0993
Model C500P (75 lbs/hr), Model CB400 (100 lbs/hr) - (Gas Fired); Model C1000H (150 lbs/hr); Model CB800 (200 lbs/hr)

***Industrial Equipment & Eng***., Dave Lutz, PO Box 547796, Orlando, FL (407) 886-5533, (800) 327-2831, fax (407) 886-5990
Power Pak Junior (75 lbs/hr), Power Pak II (150 lbs/hr)

***National Incinerator, Inc.***, Pamela Price, PO Box 1651, Corsicana, TX 75151, (800) 544-0661
Model DV-100TX (100 lbs/hr); Model 2H46-M (100 lbs/hr) (Gas, LPG)

***Pennram Diversified Manufacturing Corp.***, Andy Hooker, 1315 W. 3rd St., Williamsport, PA 17703-0695, (717) 327-2802
Model C-200

***R & K Incinerator***, Mark Kaehr, 6125 W - 100 South, Decatur, IN 46733, (800) 233-1163

***Shenandoah Mfg. Co. Inc.***, Rick Gregory, PO Box 839, Harrisonburg, VA 22803 (918) 825-9575

***Therm Tec***, Dean Robbins, PO Box 1105, Tualatin, OR 97062, (503) 625-7575, fax (503) 625-6161
Model S-18 (200 lbs/day), Model S-27T (350 lbs/day)

# Supplemental Information for Form 7
## Poultry Incinerators

**Incinerator Information:**

Incinerator Manufacturer _____

Model Number _____ ☐ Manufacturer's specifications attached

Incinerator Type: (check one) ☐ Single Chamber ☐ Multiple Chamber

Maximum Rated Capacity _____ (lbs/hr) _____ (lbs/day)

Minimum Secondary Chamber Temperature _____ °F

Minimum Secondary Residence Time _____ Seconds

Burn Down Cycle Hours

**Fuel Information:**

Auxiliary Fuel (check) ☐ Propane ☐ Distillate Oil ☐ Natural Gas ☐ Other (list)

Primary Burner _____ BTU/hr

Secondary Burner BTU/hr

**Stack Information:**

Configuration (check one each row) ☐ Vertical ☐ Horizontal or Downward ☐ Unobstructed ☐ Raincap

Stack Diameter (inches) _____ Stack Height (feet) _____

Exit Gas Velocity (acfm) _____ Exit Gas Temperature (°F) _____

**Waste Information:**

Type (check one) ☐ Poultry Poultry Type (list) _____ ☐ Other (list) _____

Total Flock Size: _____ birds _____ Flocks/year

Estimated Annual Waste Throughput _____ Lbs./year

| Maximum Operating Schedule: | Hours per Day | Days Per Week | Weeks per Year |
|---|---|---|---|
| | | | |